

What is claimed is:

1. A slider for a disk drive, comprising:

a slider body that extends along a first reference axis that defines a longitudinal extent of said slider body, wherein said slider body comprises:

5 upper and lower surfaces, wherein said lower surface projects toward a storage medium of the disk drive when said slider is installed in said disk drive;

a leading edge and a trailing edge which is longitudinally spaced from said leading edge relative to said first reference axis, wherein said storage medium moves relative to said slider when incorporated in said disk drive in a direction that is at least generally from said 10 leading edge of said slider body to said trailing edge of said slider body;

first and second sides that are laterally spaced relative to said first reference axis, wherein said lower surface of said slider body comprises:

a first air bearing pad;

a first air pressurizing step associated with first air bearing pad and that is 15 disposed immediately in front of said first air bearing pad in a direction of leading edge, wherein an area bounded by said leading edge, said trailing edge, said first side, and said second side is of a first magnitude, wherein a surface area of said first air bearing pad is of a second magnitude, and wherein a ratio of said second magnitude to said first magnitude is no more than about 0.004; and

20 a transducer disposed within said first air bearing pad.

2. A slider, as claimed in Claim 1, wherein:

at least part of said first air bearing pad is disposed within about 0.002 inch of said trailing edge.

3. A slider, as claimed in Claim 1, wherein:

said first air bearing pad is centrally disposed on said first reference axis.

4. A slider, as claimed in Claim 1, wherein:

said first air bearing pad has a surface area of no more than about 0.00001 in<sup>2</sup> of slider  
5 area.

5. A slider, as claimed in Claim 1, wherein:

a depth of said first pressurizing step is within a range of about 0.5 microinches to about  
3 microinches.

6. A slider, as claimed in Claim 1, wherein:

10 a depth of said first pressurizing step is about 1.5 microinches.

7. A slider, as claimed in Claim 1, further comprising:

a second air bearing pad, wherein said first air bearing pad is disposed on and protrudes  
from said second air bearing pad; and

15 a second pressurizing step associated with second air bearing pad and that is disposed  
immediately in front of said second air bearing pad in a direction of leading edge.

8. A slider, as claimed in Claim 7, wherein:

a depth of said second pressurizing step is different from a depth of said first pressurizing  
step.

9. A slider, as claimed in Claim 8, wherein:

20 said depth of said second pressurizing step is greater than said depth of said first  
pressurizing step.

10. A slider, as claimed in Claim 7, wherein:

a depth of said second pressurizing step is within a range of about 3 microinches to about 8 microinches, and wherein a depth of said first pressurizing step is within a range of about 0.5 microinches to about 3 microinches.

5 11. A slider, as claimed in Claim 7, wherein:

a depth of said second pressurizing step is about five microinches and wherein a depth of said first pressurizing step is about 1.5 microinches.

12. A slider, as claimed in Claim 1, wherein:

said first air bearing pad comprises means for generating at least about 15 percent of a  
10 total uplift force exerted on said slider body when used in the disk drive.

13. A slider, as claimed in Claim 1, wherein:

said first air bearing pad comprises means for concentrating a pressure on said air bearing pad that is at least about 10 times greater than any other pressure exerted on any other portion of said lower surface of said slider body when used in the disk drive.

15 14. A slider, as claimed in Claim 1, wherein:

said first air bearing pad comprises means for creating a pressure of at least about 400 psi on said first air bearing pad when used in the disk drive.

15. A slider for a disk drive, comprising:

a slider body that extends along a first reference axis that defines a longitudinal extent of said slider body, wherein said slider body comprises:

upper and lower surfaces, wherein said lower surface projects toward a storage  
5 medium of the disk drive when said slider is installed in said disk drive;

a leading edge and a trailing edge which is longitudinally spaced from said leading edge relative to said first reference axis, wherein said storage medium moves relative to said slider when incorporated in said disk drive in a direction that is at least generally from said leading edge of said slider body to said trailing edge of said slider body;

10 first and second sides that are laterally spaced relative to said first reference axis, wherein said lower surface of said slider body comprises:

a first air bearing pad;

a first pressurizing step associated with first air bearing pad and that is disposed immediately in front of said first air bearing pad in a direction of leading edge;

15 a negative pressure suction cavity comprising a cavity base, wherein said cavity base is recessed a significant amount in relation to said first air bearing pad; and

a transducer disposed within said first air bearing pad, wherein a size of said first air bearing pad is selected such that at least a substantial portion of said first air bearing pad expands during read/write operations using said transducer.

16. A slider, as claimed in Claim 15, wherein:

an area bounded by said leading edge, said trailing edge, said first side, and said second side is of a first magnitude, wherein a surface area of said first air bearing pad is of a second magnitude, and wherein a ratio of said second magnitude to said first magnitude is no more than  
5 about 0.004.

17. A slider, as claimed in Claim 15, wherein:

an entirety of said first air bearing pad is disposed within about 0.002 inch of said trailing edge.

18. A slider, as claimed in Claim 15, wherein:

10 said first air bearing pad is centrally disposed on said first reference axis.

19. A slider, as claimed in Claim 15, wherein:

said first air bearing pad has a surface area of no more than about 0.00001 in<sup>2</sup>.

20. A slider, as claimed in Claim 15, wherein:

a depth of said first pressurizing step is within a range of about 0.5 microinches to about  
15 3 microinches.

21. A slider, as claimed in Claim 15, wherein:

a depth of said first pressurizing step is about 1.5 microinches.

22. A slider, as claimed in Claim 15, wherein said lower surface further comprises:

20 a second air bearing pad, wherein said first air bearing pad is disposed on and protrudes from said second air bearing pad; and

a second pressurizing step associated with second air bearing pad and that is disposed immediately in front of said second air bearing pad in a direction of leading edge.

23. A slider, as claimed in Claim 22, wherein:

a depth of said second pressurizing step is different from a depth of said first pressurizing step.

24. A slider, as claimed in Claim 23, wherein:

5 said depth of said second pressurizing step is greater than said depth of said first pressurizing step.

25. A slider, as claimed in Claim 22, wherein:

a depth of said second pressurizing step is within a range of about 3 microinches to about 10 8 microinches, and wherein a depth of said first pressurizing step is within a range of about 0.5 microinches to about 3 microinches.

26. A slider, as claimed in Claim 23, wherein:

a depth of said second pressurizing step is about five microinches and wherein a depth of said first pressurizing step is about 1.5 microinches.

27. A slider, as claimed in Claim 15, wherein:

15 said first air bearing pad comprises means for generating at least about 15 percent of a total uplift force exerted on said slider body when used in the disk drive.

28. A slider, as claimed in Claim 15, wherein:

said first air bearing pad comprises means for concentrating a pressure on said first air bearing pad that is at least about 10 times greater than any other pressure exerted on any other 20 portion of said lower surface of said slider body when used in the disk drive.

29. A slider, as claimed in Claim 15, wherein:

said first air bearing pad comprises means for creating a pressure of at least about 400 psi on said first air bearing pad when used in the disk drive.

30. A slider, as claimed in Claim 15, wherein said lower surface further comprises:

a second air bearing pad disposed at least generally toward said leading edge and a second pressurizing step associated with said second bearing pad and that is disposed  
5 immediately in front of said second air bearing pad in a direction of said leading edge;

31. A slider, as claimed in Claim 30, wherein:

at least part of said second air bearing pad is disposed within about 0.020 inch of said leading edge.

32. A slider, as claimed in Claim 15, wherein said lower surface further  
10 comprises:

second and third air bearing pads disposed at least generally toward said trailing edge, a second pressurizing step associated with said second air bearing pad and that is disposed immediately in front of said second air bearing pad in a direction of said leading edge, and a third pressurizing step associated with said third air bearing pad and that is disposed immediately  
15 in front of said third air bearing pad in a direction of said leading edge.

33. A slider, as claimed in Claim 32, wherein:

at least part of each of said first air bearing pad and said second and third air bearing pads are disposed within about 0.002 inches of said trailing edge.

34. A slider, as claimed in Claim 32, wherein:  
20 said first air bearing pad is disposed laterally between said second and third air bearing pads relative to said first reference axis.

35. A slider, as claimed in Claim 32, wherein:

said first air bearing pad is disposed closer to said trailing edge than each of said second and third air bearing pads.

36. A slider, as claimed in Claim 32, wherein:

5 a depth of each of said second and third pressurizing steps are of a first magnitude, and wherein a depth of said first pressurizing step is of a second magnitude that is different from said first magnitude.

37. A slider, as claimed in Claim 36, wherein:

said first magnitude is within a range of about 3 microinches to about 8 microinches, and  
10 wherein said second magnitude is within a range of about 0.5 microinches to about 3 microinches.

38. A slider, as claimed in Claim 36, wherein:

said first magnitude is about five microinches and wherein said second magnitude is about 1.5 microinches.

15 39. A slider, as claimed in Claim 36, wherein:

said first magnitude is greater than said second magnitude.

40. A method for flying a slider relative to a data storage medium, said slider comprising a first air bearing pad and a transducer, said method comprising the step of:

flying said slider above said data storage medium, wherein said flying step comprises pressurizing a fluid between said first air bearing pad so that a pressure that is exerted on at least 5 part of said first air bearing pad is at least about 400 psi; and

exchanging at least one signal between said transducer and said data storage medium during at least a portion of said flying step.

41. A method, as claimed in Claim 40, wherein:

said pressure that is exerted on at least part of said first air bearing pad is about 500 psi.

10 42. A method, as claimed in Claim 40, wherein:

said flying step comprises exerting a lifting force on a lower surface of said slider that has said first air bearing pad, wherein a portion of said lifting force that is exerted on said first air bearing pad is at least about 15 percent of a total said lifting force that is exerted on said lower surface of said slider.

15 43. A method, as claimed in Claim 40, wherein:

said flying step comprises flying said slider at a first fly height above said data storage medium, said exchanging step comprises providing a signal to said transducer, and said method further comprises expanding said first air bearing pad in a direction of said data storage medium from said providing step, wherein said flying step comprises flying said slider at a second fly height after said expanding step, wherein said second fly height is less than said first fly height by no more than about 20 percent of said first fly height.

44. A method for flying a slider relative to a data storage medium, said slider comprising a first air bearing pad and a transducer disposed within said first air bearing pad, said method comprising the steps of:

executing a first flying step comprising flying said slider at a first fly height above said

5 data storage medium;

providing a signal to said transducer during said executing a first flying step;

expanding said first air bearing pad in a direction of said data storage medium during said providing step; and

executing a second flying step comprising flying said slider at a second fly height after

10 said expanding step, wherein said second fly height is less than said first fly height by no more than about 20 percent of said first fly height.

45. A method, as claimed in Claim 44, wherein:

at least one of said executing a first and second flying step comprises pressurizing a fluid

between said first air bearing pad so that a pressure that is exerted on at least part of said first air  
15 bearing pad is at least about 400 psi.

46. A method, as claimed in Claim 44, wherein:

said pressure that is exerted on at least part of said first air bearing pad is at least about  
400 psi.

47. A method, as claimed in Claim 44, wherein:

20 at least one of said executing a first and second flying step comprises exerting a lifting force on a lower surface of said slider that has said first air bearing pad, wherein a portion of said lifting force that is exerted on said first air bearing pad is at least about 15 percent of a total said lifting force that is exerted on said lower surface of said slider.